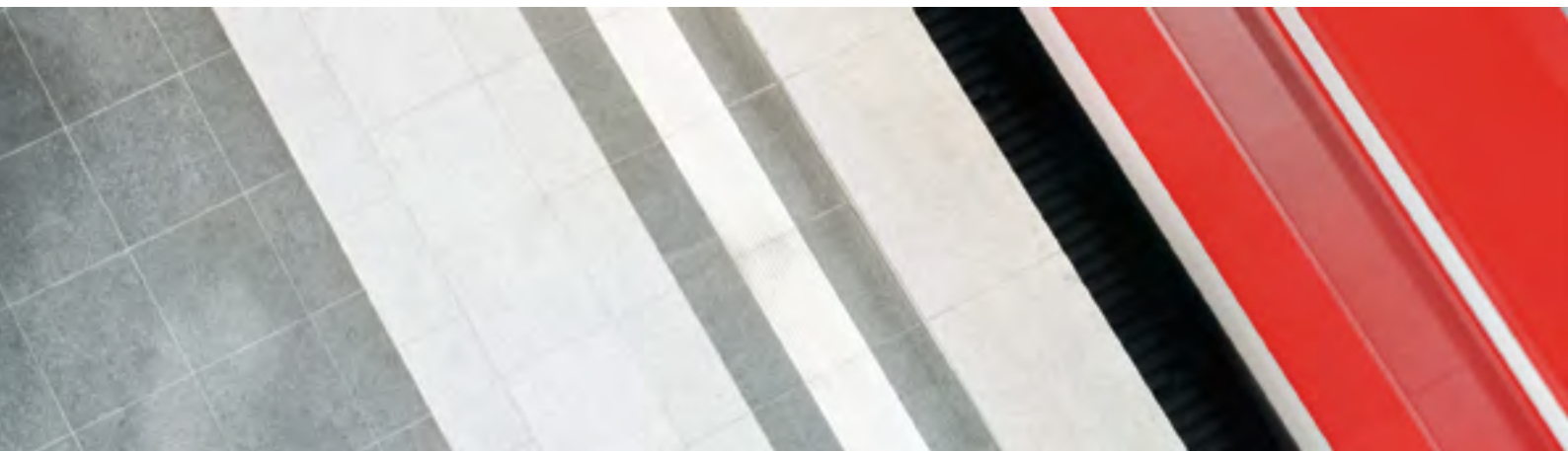


ANNUAL REPORT



optimising railways



2013

Inspired by our new website, the visual theme for this year's report is to look at trains, tracks and stations from unusual perspectives. This corresponds to the philosophy of SMA – we examine projects and tasks from different angles without preconceived ideas.

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Introduction

After the management buyout, 2013 promised to be an exciting year for SMA, and it has lived up to its promise. This past year brought us many orders, in new technical and geographical markets, which we have been able to grow into over the last quarter-century.

There is a mood of revitalisation at SMA, and in keeping with this, we have given this Annual Report a gentle makeover with newly designed content. It therefore symbolises the values and approach of our company: we value what we have achieved to date, while simultaneously remaining open to new developments, which we adopt enthusiastically.

In the following pages, we would like to give you a more in-depth view than previously of SMA's methods. A Market Director gives a detailed insight on the current challenges facing the railways in France. A major project for a new timetabling system at DB long-distance traffic is viewed from three different perspectives: from the viewpoint of the client, the project manager and a software developer. Finally, we offer insights into our strategic approaches and, as always, into some selected projects from the past year.

When putting together these contributions, we are once again reminded of how closely the components, systems and railways are intertwined and interdependent. Anyone who makes it their motto to assist in continuing to improve the system must always consider this integration. Everyone is aware of their responsibility within the entire network, and perhaps this puts the rail system ahead of other sectors in the business world, where disproportionately high personal and collective quarterly goals are certainly overvalued. It may soon become reality that the rest of the business world learns from the railways and adopts the systematic perspective.

The SMA management hopes you will find the 2013 Annual Report stimulating reading.

Eric Cosandey
CEO, Head of Consulting

Thomas Bickel
Head of IT

Strategy

The buyout of SMA by the new management team was accompanied by a strategy definition. This included the aim of confirming our independence, which is why we did not consider private equity investors. The second major strategic aim of SMA is to make the consulting and IT solutions even more integrated. We recognise that experienced consultants are supremely suited to coordinate IT projects and that, in turn, IT project managers can make an important contribution to consulting. The know-how transfer between the two main business divisions holds a huge potential not only for our clients but also for the career prospects of our staff.

The dynamic market environment promises continued growth potential. Thus, we will continue to strengthen and develop our core markets and core competencies because they stabilise our business model and serve as reference cases. As in the past, we want to focus our energies in the core European states with their dense rail networks, where we are also most familiar with the languages, cultures and systems. Alongside this, we intend to extend our sphere of influence into other regions of Europe, for example, into Scandinavia. In addition, the USA possesses special potential, where pilot projects are already up and running.

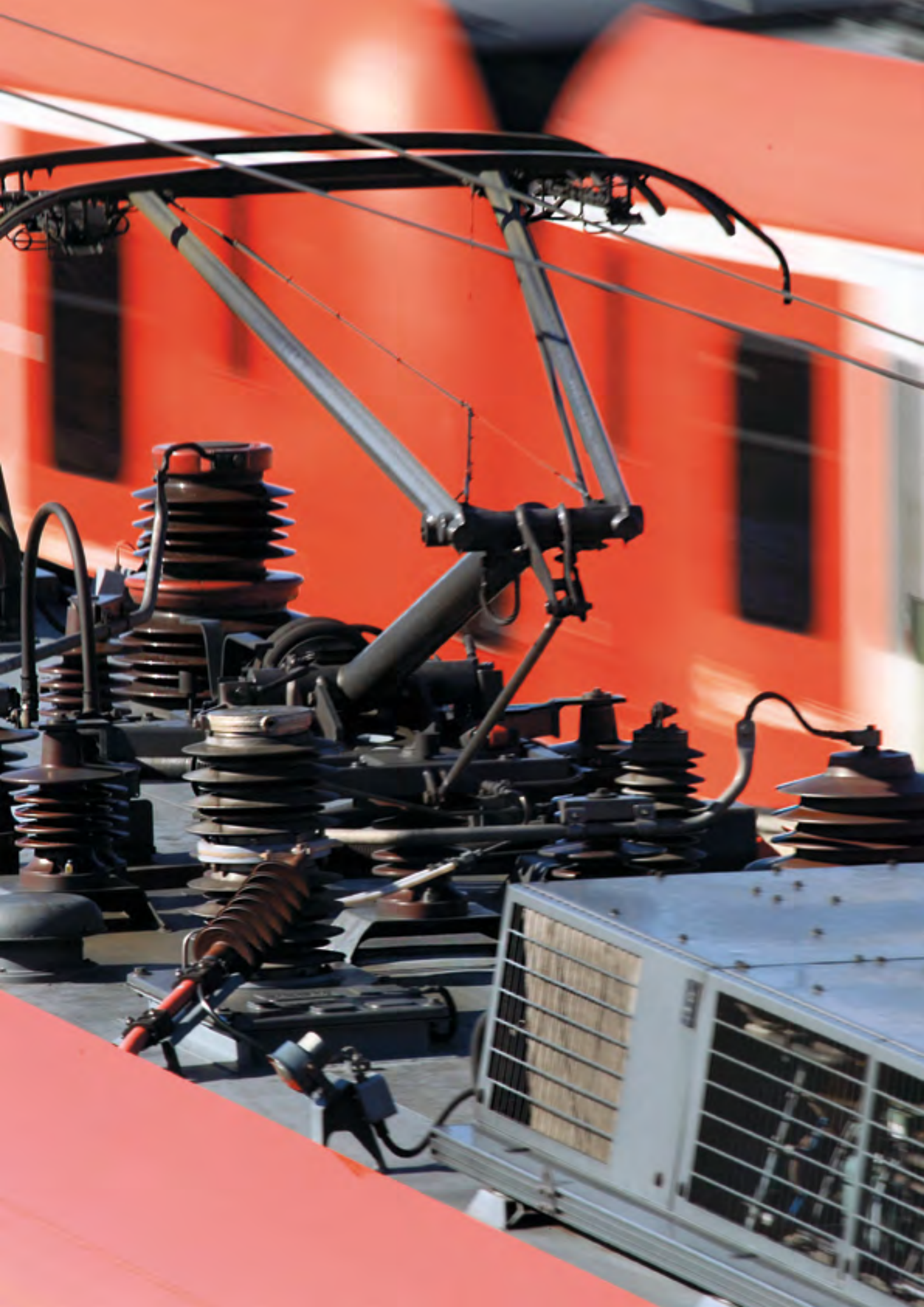
In future, strategic partnerships with suitable companies will play an increasingly important role in consulting. These partnerships support the vertical diversification of SMA so that we can progress from our core activities of railway system planning and operations optimisation into sectors such as construction, maintenance, rolling-stock strategy, and economic and strategic consulting.

SMA has always had a close connection with a continuous timetabling production process through to dispatching. The design of the overall service offer, the resulting requirements of the infrastructure, the optimisation of the service with regard to future production, the path allocation taking account of the infrastructure available at short notice, and finally the production of mobility in dispatching – we regard all of this as a single continuous process.

However, to implement such a continuous timetable production process is a complex undertaking. Barriers have arisen in recent years between professional and technical perspectives that make this work even more difficult. On the one hand, an ever growing importance is attached to modern IT systems with increasing integration with operations; on the other hand, the complexity in the technical and procedural area has increased sharply. Both led to intense specialisation by the providers of consulting and implementation services in proximity to the company environment.

Consequently, SMA has decided to deepen and expand our professional and technical expertise in the implementation of timetable production systems. We are therefore strengthening our team of consultants with many years' experience in production-related process sectors and also continuing to develop the Viriato system in a targeted manner at both the model and the architectural level – right through to a system that will best support the direct implementation of the timetable production process.

Implementing and maintaining such systems demands significant staff and financial resources. But we want to stick to our strategy of focussing rigidly on our core competences. For this reason, SMA has entered a partnership with one of the largest international IT companies which is able to provide the necessary resources, and to integrate beneficially with SMA's professional and technical knowledge.



A Market Director's Perspective

The Market Director for SMA's Consulting division coordinates all relations with current and future clients within their market and ensures the company's strategy is implemented. To this end, they direct the Key Account Managers allocated to their market and help them oversee production, via the project managers, to guarantee quality and ensure that clients' needs are met. Luigi Stähli is Market Director for South-Western Europe, which covers Switzerland, France, Belgium, Luxembourg, Italy, Spain and Portugal.

The Market Director must have a comprehensive understanding of the institutions, specific cultural facets and the political challenges of each country in their market, as well as the aims and expectations of the main players. They must understand the railway network and how it works, and be familiar with all major ongoing and future projects. This should enable them to anticipate any changes in the market and prepare responses that meet the needs of current and future clients. Furthermore, they must understand the competitive situation within the market in order that they can position the company appropriately and establish strategic partnerships.

In France, the main challenges relate to planned reforms as to how the rail system is managed, with the creation of a unified infrastructure manager and a single body bringing together the rail operator and infrastructure manager, as well as the commissioning of major new infrastructure and its integration into the national and regional networks. The main projects are the construction of four new lines (LGV East 2nd stage from Baudrecourt–Strasbourg, LGV BPL from Bretagne–Pays de la Loire, LGV SEA from Tours–Bordeaux, and the Nîmes–Montpellier Bypass), the EOLE project to create a new east-west connection on the RER E in Île-de-France and various projects in the regions and major cities, including Lyon, Marseille and Lille.

The main players include the Regions and the French state, which have authority for the TET and long-distance trains and hold high expectations regarding both the quality of this service and the costs of running it. Given the significant cost of investment in rolling stock and infrastructure development, it is essential that resources are used efficiently through optimising operations, fleet usage and infrastructure.

The condition of the rail infrastructure is also important: it must be maintained at a reasonable cost to society, taking into account the varying requirements of high-speed lines, main lines and the lesser used regional lines. Given the extent of the work involved, the distribution of capacity between train paths and maintenance work must be considered, with the aim of finding an optimal balance between the costs of the work and having minimal impact on train paths and the corresponding revenue.

In this context, our first priority is to listen to the various players within the system, in order to understand their perspectives, constraints and expectations. SMA's role is to be a catalyst for solutions, helping to set objectives and identify constraints, leading to the development of options that can be assessed objectively before bringing all the players together to agree on the best solutions. To this end, SMA considers the system as a whole in order to arrive at a global optimum that guarantees the integration within the network, incorporating all traffic, and realistically phased implementation plans for the various planning horizons.

The use of methods based on a level of precision appropriate to requirements allows SMA to perform effective studies while ensuring coherence and integration into the network. For example, our work for the RER E western extension project (EOLE) requires detailed studies in the heart of the Parisian network alongside a macroscopic approach to integrate the project into an area extending from Normandy to Champagne.

However, technical solutions alone are not enough to guarantee a stable outcome! We must also ensure that the solution is acceptable and that its principles and challenges are communicated and presented in line with the perceptions and expectations of all those involved.

The Market Director works with the Key Account Managers to oversee all of these aspects. They ensure that all expectations are taken into account and help to develop appropriate solutions, in order to establish a relationship with our clients based on trust and partnership, and so help develop a railway that meets society's needs.

“This new planning tool is designed to provide all planners with a common source timetable from which all relevant data can be obtained, regardless of whether it is for planning long-term, short-term, yearly or timescales of less than one year.”



A major project from three different perspectives

The client view: Kai-Uwe Freiburger from DB Long Distance DB Long Distance plans to harmonise the different timescales of timetable planning more closely with a new system. This new planning tool is designed to provide all planners with a common source timetable from which all relevant data can be obtained, regardless of whether it is for planning long-term, short-term, yearly or timescales of less than one year. The information must be uniformly usable in all planning phases, and for all current and future time contexts. The planners retrieve the data required from the source timetable and adjust it according to their specific planning projects. In this way, adjustments made in one sector can be taken into account right from the start by other planners in their planning activities.

The system is intended to support the planner in dealing with the diversity of data versions, which is the result of increasing differentiation of the offer for the best possible operation of transport markets.

In addition, in the future economic aspects are to be systematically integrated into timetable planning. The planners therefore require appropriate information in order to better estimate the economic consequences of various scenarios. For example, it will be possible to enter punctuality data, which will immediately show the past reliability of a specific connection. In addition, users will be able to add items into the planning process about such varied actions as engineering works or marketing campaigns.

The project manager view: Markus Apell from SMA SMA was awarded the contract in the selection procedure by DB and started implementation in April 2012. This contract came at a favourable time for us as the development of Viriato 8 had just begun. This offered DB the advantage that they could have their specific requirements incorporated into the new version of Viriato right from the start. From SMA's perspective, our internal development project benefited from the client's expectations, particularly in terms of quality and scope of operation but also in terms of prompt completion of the new version.

A large part of DB's contract consists of individual functions and modules that are only relevant for them. Internally, we call this version Viriato.FF (for "Fahrplan-Fortschreibung", developing the timetable). The most important portion of the project implementation was during the specification phase: in regular workshops with DB Long Distance and DB Systel the functional requirements were developed from the tender documentation into a specification as a basis for implementation. Applying the day-by-day principle, we were able to react flexibly to changes in requirements, by replacing obsolete components with new requirements.

In software development, a distinction is made in the type of implementation between a traditional model (e.g. waterfall, V model) and an agile model (e.g. Scrum). In the traditional model, the individual development phases occur in strict sequential order: there are requirements and design, implementation, test and integration phases. A feature of agile development is the iterative process whereby a ready-to-run, improved application is always available in very short cycles.

Working together with the client, we developed a process which accommodated the two methods. The specification was executed according to the waterfall method with sequential quality gates to ensure performance. This provided tailored solution descriptions for the development. The development itself was carried out according to the Scrum methodology. Thus, we ensured that the client could track progress of the project in real time and, where necessary, we could respond to change requests.

On 20 December 2013, Deutsche Bahn approved Release 2 of Viriato.FF. On 17 February 2014, the long-term planners at DB started working with the new planning tool. The project continues this year: SMA will roll out Release 3b in mid-May. With this release, it will be possible to plan the working timetable, e.g. in the event of diversions due to engineering works. From November 2014, the solution will finally be fully operational and our involvement in the project will be largely completed.

The software developer's view: Urs Dietrich from SMA The Viriato.FF project for Deutsche Bahn was already running when I started working at SMA early in 2012. It is a massive project, and at times all of the development teams were involved. One team is responsible for interfaces, the path portal, PCS and railML, a second team for Viriato Standard, network visualisation and the graphic timetable, and the third team for the tabular timetable and FF-specific aspects such as the Rotheft, a DB-specific timetable publication.

My responsibility is currently the path portal. This is available as a web service to all train operators that want to use the DB network. I work on sub-yearly planning: this involves changes on specific days, which results in old contracts for paths having to be cancelled and new ones being despatched.

We are now working on both Viriato 8 Standard and Enterprise versions. Since Viriato 7 in 2012, we have used the C#.NET framework instead of Visual Basic which was used for Viriato 6 and earlier versions. For the first time in Viriato 8 Enterprise we can now have multiple versions of infrastructure scenarios in a single timetable. For example, for modifications to station layouts, the planner can run through several concepts and compare them against each other. Trains can be differentiated from each other down to the last detail, even if the train has a different schedule every day.

Viriato Standard and Viriato Enterprise have a common base, and thus changes to one component can affect the entire system. Our aim is therefore to automatically test as much as possible. The functionality of the project is now almost complete and increasing numbers of users are now working productively with the system and supply us with feedback. At SMA we use a copy of DB's database to simulate use in the real environment. However, from time to time, fine adjustments still have to be made at their offices in Frankfurt.

“The use of methods based on a level of precision appropriate to requirements allows SMA to perform effective studies while ensuring coherence and integration into the network.”



A selection of projects from 2013



SNCB: Study 110 paths At present more than 90 trains per hour run on the Brussels North-South link (JNM) during peak times. Based on the likely increase of demand by 2026 it is predicted that there will be a requirement for 110 trains per hour. However, the theoretical maximum capacity of the JNM is only 96 trains per hour. Against this background, SNCB had defined two study concepts for restructuring the link: if a portion of future traffic can be re-routed to less busy routes in the Brussels region, then the JNM should be able to meet the forecasted requirements.

The aim of the study was to analyse these two scenarios in terms of feasibility – looking at transport planning, the quality of the link, and management of capacity. In addition, capacity bottlenecks were identified and solutions developed.

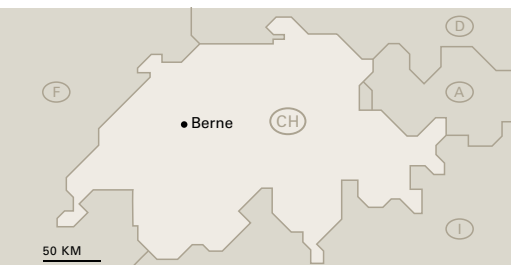
The structure of the rail service in the Brussels region has a significant influence on virtually the entire Belgian rail network. For this reason, SMA used Viriato to develop a complete national timetable for each scenario.

The study demonstrated the advantages and disadvantages of both proposed scenarios in terms of quality (train spacing, regular intervals, etc.). It emerged that infrastructure investments external to the JNM itself will be essential if a portion of the traffic is re-routed to other routes instead of an upgrade to the JNM. Based on the demand for mobility, the operator's requirements and taking account of longer-term infrastructure measures, long-term planning (2030–2050) has to establish the structure of the rail service for Brussels and the corresponding high level of investment in the rail network.



Consulting for CSC on integrating ZLR at Infrabel One of the core activities of railway planning is to determine technically feasible journey times. Only a few decades ago, empirical values were considered good enough. But today it is essential to carry out precise calculations taking into account as many contributing parameters as possible. A train running time calculator must cover a wide variety of requirements and traditionally is used differently in each country. Numerous train run time calculations of the current timetable situation are necessary for dispatching decisions, and the calculations have to be performed at short notice and are dependent on many continually changing factors.

The ZLR ("Zuglaufrechnung") standalone service-based calculation system was originally developed from the Viriato running time calculator by SMA for SBB. While SBB uses ZLR productively for timetable preparation and dispatching, Infrabel will use it for its new path management system. SMA is supporting the project partners involved in configuring ZLR for the specific conditions in Belgium and integrating it into the system landscape of the new traffic management system there.



Swiss Federal Office of Transport: Office for preparing the tender for STEP Upgrade Phase 2030

The development scenarios in the Swiss Confederation leave no doubt that rail passenger transport in Switzerland will continue to grow. According to traffic forecasts, an above-average increase in demand can be expected in the conurbations and particularly at peak times of the day until 2030. Growth in freight traffic can also be expected. The Federation wants to demonstrate by 2018 how this increase in traffic will be managed. It is using as its basis the parliamentary decision of 21 June 2013 concerning the railway infrastructure fund (BIF) and the 2025 Upgrade Phase and the contract to draw up a draft for the next upgrade phase for 2030.

SMA is supporting Project Management at the Swiss Federal Office of Transport (FOT) in preparing the tender for STEP Upgrade Phase 2030 in the service and infrastructure planning sector. The companies Infras and EBP are also part of the project. SMA's core responsibilities include validation, inspection, preparation and coordinating of tender, infrastructure and operational concepts in rail transport.

From 2014 the cantons are also included in the planning process. 2013 was primarily a year of preparation: the service planning benchmarks for the 2030 Upgrade Phase had to be fixed, which involves the starting point for the 2025 Upgrade Phase and long-term planning of long-distance transport for a 2050 timescale. The SBB plans for the 2025 timescale were evaluated and supplemented. In addition, the strategic direction of the long-term perspective of the railway had to be developed and deepened. The goal of the second study was the long-term development of the rail node structure and system-determining long-distance transport in Switzerland in order to ensure the forwards compatibility of the 2030 Upgrade Phase.

Further work involved defining criteria for separating long-distance and regional transport and assessing their effects on the present structure. In collaboration with SBB, further potential operational areas were presented for trains with WAKO technology (roll compensation) mechanisms.



Swiss Federal Office of Transport: Support in the planning of the Neuchâtel 2016+ rail network

The route at the foothills of the Jura Mountains is one of the last axes in the Swiss long-distance network which does not provide a half-hour regular interval service. Within the framework of works for the Geneva 2030 project, whose goal is to develop the rail network in the Lake Geneva basin, SBB and the Swiss Federal Office of Transport have developed a new basic timetable for the period 2016–2025. This proposes a 30-minute regular interval for the ICN service as far as Yverdon, which in the first half of the hour continues to Lausanne and to Geneva in the second. In order to maintain the existing connections to Lausanne and Geneva, as well as to Basel and Zurich, the Neuchâtel canton must restructure the regional service.

The FOT commissioned SMA to support the Neuchâtel 2016+ Working Group and to propose feasible solutions for 2016 which retain the 2013 service, guarantee integration into the national network, improve operation, and take into consideration the minimum required infrastructure developments.

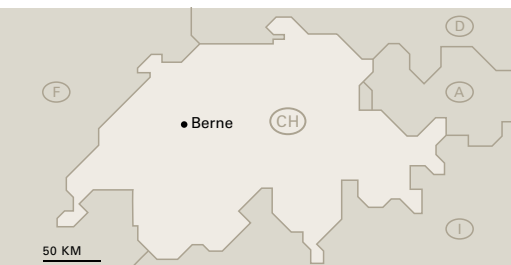
SMA's methodology was based on analysing each subsystem and developing a realisable solution for 2016. The successful collaboration of all participants resulted in a concept that meets all objectives and was approved by FOT, SBB and the Neuchâtel canton. It is part of a declaration of intent in which the canton, SBB and FOT all agree to do everything in their power to ensure that the 2016 timetable can come into operation.



Zurich Transport Network and SBB: Zurich S-Bahn 2nd Generation – Phase 3 This summer the new through line, known as the “Durchmesserlinie”, will be opened in Zurich. This is the start of the implementation of the final agreed upgrade phase of the Zurich S-Bahn. This package of work is known as the “4th Partial Extension to the S-Bahn” and is intended to be completed by the end of 2018. However, the increase in demand in the Zurich conurbation indicates that these measures are capable of removing only the worst bottlenecks.

The Zurich Transport Network (ZVV) together with SBB has therefore been grappling for several years with developing the Zurich S-Bahn further. With the collaboration of SMA, a target concept has emerged, which starts from the assumption that demand will double in all corridors of the present S-Bahn network. The core of this target concept is the use of an “inner” and “outer” S-Bahn. While the “inner” S-Bahn with new single-decker and multi-door vehicles is designed for a faster passenger exchange and high capacity in the core area of Zurich City, the modern double-decker designs already in use run as the “outer” S-Bahn out to the network stations further out.

Since 2013, SMA has been working with SBB Infrastructure on the first implementation phase towards the target concept for the planning horizon for 2030. The timetable planning is based on the long-distance concept, from the STEP plans for 2030. Building on this, a feasible, optimised concept will be developed for each corridor, containing justifiable infrastructure upgrades for the 2030 horizon and forecasted demand. Coordinating the S-Bahn transport within the constraints of long-distance and freight transport presents a real challenge to the planning team.



Energy management SBB Infrastructure: Analysis of potential Energy savings in the service offer

The Swiss Confederation's energy strategy is to safeguard Switzerland's power supply in the long-term and as part of this requires an increase in energy efficiency in both public and private transport. SBB has therefore set itself the target of supplying upgraded services with renewable energy by 2025 and the entire rail power supply itself in the future. The main aim of SBB's strategy is to reduce demand, increase efficiency, and control and reduce peak loads. Annual savings of 600 GWh should be possible based on the forecasted energy consumption for 2025, which corresponds to the energy consumption of approximately 150,000 households. The total savings potential can only be fully exploited if, in addition to technical measures and behavioural changes, the timetable service and its operational implementation are adjusted.

Together with an expert group from SBB and FOT, SMA has identified starting points and methods for increasing efficiency in the service offer and timetable. Parameters, dependencies and framework conditions have been identified as the basis for in-depth studies, and strategies have been analysed and assessed for their consequences, their energy-saving potential and feasibility. SMA has calculated the energy consumption of various measures and extrapolated that to the standard gauge network of the whole of Switzerland.

The study has shown that it is more likely to achieve the energy target in the service offer if the economic prerequisites, for example the energy price, and the generic framework conditions, such as the Swiss node system, are also discussed. Therefore, the opportunity to develop a service concept for the 2030 Upgrade Phase must also be taken from the perspective of lower energy consumption.



Maximising capacity for Santiago Metro The metro network in Santiago de Chile, currently consisting of five lines, transports approximately 2.5 million passengers daily. This makes it one of the busiest metro networks in the world, particularly in the central stations. To accommodate this extreme capacity utilisation, two new routes are currently being constructed which will become operational in 2018. The existing Line 1 will additionally be equipped with an automated CBTC control system.

SMA conducted a study to assess the capacity limit of the existing network and to optimise the new network capacity following the major planned investments. The study also offers a basis for design of stations and producing a socio-economic study and business plan for the Santiago Metro.

During the first phase, SMA took measurements on site and had discussions with the signal engineering and safety experts at Santiago Metro. On this basis, we modelled the specific system of Line 1, which serves as a reference line for the project, in the dynamic simulation tool OpenTrack. By repeatedly varying in numerous simulation models the service pattern, rolling stock, infrastructure and equipment, including the CBTC system, we were able to determine the methods for optimising the total capacity.

During this joint project, the experts at SMA and Santiago Metro developed an extremely close working relationship. For instance, an SMA specialist remained on site for three months to resolve operational problems. The reciprocal visits to Santiago and the facilities at SMA promoted a knowledge transfer, which enriched the expertise of the participants in the field of high-frequency urban rail transport networks.



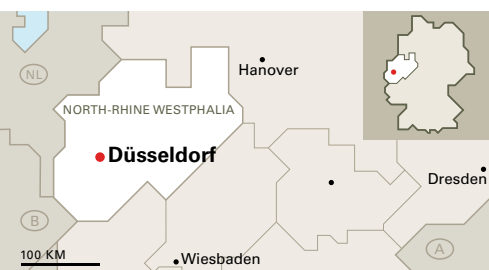
DB Netz AG: Timetable automation neXt – Timetable project model and trialling the allocation algorithm

Continuing the neXt process consulting project on timetable automation at DB Netz AG from 2012, in 2013 SMA developed and expanded various elements. The focus lay in refining the allocation algorithm used to allocate pre-designed systematic paths for freight movement to the actual requests of the train operators. We analysed the results of the algorithm and verified its plausibility in a test allocation using data from current operations.

SMA also developed a timetable object model which covered path construction and infrastructure in addition to the existing allocation object model. In addition to process diagrams, this new object model is used to abstract sequences and functions in a process and forms the basis for developing software tools that DB Netz AG will use for timetable development and path allocation in the future.

While we defined the processes for the service offer and network timetable, we simultaneously detailed the requirements for demarcating and characterising the network that will in the future be handled according to the automated timetable procedure.

At the heart of the discussions were the type of path construction and path connection in the medium and large network nodes. Additionally this project raised the question of suitable infrastructure data granularity for the various applications.



Design planning for a 15-/30-minute regular interval in the Rhine/Ruhr/Sieg S-Bahn

The Rhine/Ruhr/Sieg S-Bahn System is a major part of the integrated Regular Interval Timetable in North-Rhine Westphalia (ITF NRW). The S-Bahn currently runs throughout the day at 20-minute intervals, and at 30-minute intervals during evenings and at weekends.

Since the introduction of the S-Bahn, the local conditions in NRW have developed in different ways. While demand is growing fast in some regions, it is stagnating in other regions, for example due to new factors such as faster alternative links or demographic changes. As the planned introduction of the Rhine-Ruhr Express envisages a 15-minute regular interval and the RB/RE system usually runs at 30-minute intervals, SMA has devised a 15/30-minute regular interval for the Rhine/Ruhr/Sieg S-Bahn. This allows fluctuations in demand during the day to be absorbed by infilling a 30-minute base interval with a 15-minute regular interval during peak travel time on some lines. In this way, greater capacity can be made available during peak times without the service having to be extended across the board.

This concept builds on the existing infrastructure. It has been iterated through numerous versions and the plans agreed with the ITF NRW Competence Centre, the commissioning authorities, North-Rhine Westphalia and DB Netz AG. It also takes into account the integration of the planned upgrades and concept adjustments in NRW, which were examined in parallel as part of upcoming tender processes.

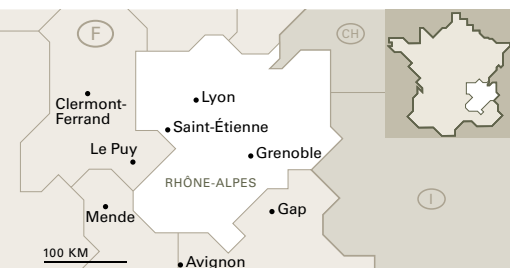
An analysis of demand, and simulation to assess operational stability, are currently underway in order to validate the results before possible full or partial implementation of the recommendations.



DB Fernverkehr AG: VDE 8 service planning support The final upgrade work as part of the German Unity Transport Project 8 (VDE 8) will be carried out in December 2017. The improvements in central Germany and Bavaria will considerably shorten the long-distance journey times between Berlin–Munich and Leipzig–Frankfurt.

The journey times resulting from the new infrastructure will give rise to changed configurations of nodes in the long-distance network and adjustments to the scheduling on routes that are used jointly by long-distance, freight and local traffic. This required early and coordinated design planning for the long-distance and local transport routes affected in the Hamburg–Berlin–Erfurt–Nuremberg–Munich and Dresden–Erfurt–Frankfurt corridors, which have to be seamlessly integrated into the existing local transport service concepts.

SMA was commissioned by DB Fernverkehr AG for the development of options and the implementation of national and regional solutions within the framework of the design work for the VDE 8 service planning. The planning goal was a national concept agreed with the commissioning authorities and DB Netz AG for long-distance and local transport in the affected Federal Länder. The aim was to develop options for adapting regional service concepts in the context of conflict resolution, among other things, to evaluate the different proposals regarding transport, political and economic criteria, and technical support given in coordination with the contracting bodies. The work was completed in December 2013 with a plan supported by all stakeholders.



Strategic planning timetable in the Rhône-Alpes Over the past decade, the planning of rail services and infrastructures in France, particularly in the Rhône-Alpes region has greatly improved. The region, RFF as well as the state took part in the implementation of the first phase of the regular interval timetable in 2008 and supported at the national level the later stages until 2012.

The planning of the regional rail connections comprises several main themes: investment in infrastructure and rolling stock as well as supply and operating costs. Based on the regular interval timetable principles the “strategic timetabling” methodology brings an infrastructure development that is consistent with the desired offer and the available resources for infrastructure, operations and rolling stock.

After an iterative optimisation procedure, several scenarios have been developed for different time horizons between 2017 and 2030. This approach allows an optimisation of the whole railway system (Offer–Timetable–Infrastructure), by identifying the relationships between supply objectives and necessary investments.

This study is the first practical application of a new and innovative methodology in France. This methodology is objective and delivers optimised answers to the main questions that need to be solved by the stakeholders in order to achieve a rational and sustainable development of the railway system.



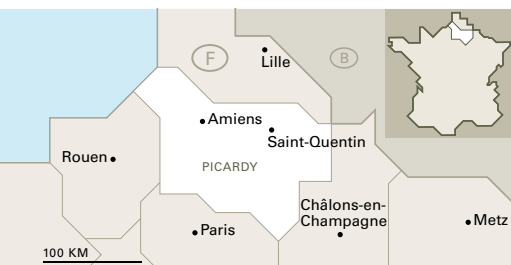
Capacity study D12 – Châtelet–Gare du Nord / B Nord+ Tunnel The B and D lines of the Paris RER network have experienced a significant increase in passenger volume over the last ten years; currently more than 1.5 million travellers use them every day. Both lines have been the subject of important modernisation projects in recent years, with the aim of absorbing the ever-growing traffic volume and improving train punctuality.

The new autumn 2013 timetables required 32 trains per hour through the Châtelet–Gare du Nord Tunnel. This tunnel is used by both routes – 20 RER B trains and 12 RER D trains. SNCF, RATP and RFF searched for solutions to guarantee the reliability of the timetables and to improve service quality compared with the previous operation.

Against this background, SMA was commissioned to write an expert report. We identified the prerequisites for guaranteeing the required robustness within the framework of the modernisation measures and the newly introduced timetables, and submitted supplementary improvement proposals.

The analysis of the timetables revealed potential weak points and sources of instability due to their interconnections with the entire system that may affect the punctuality of the operation. The Châtelet–Gare du Nord Tunnel is a critical element in the RER B + D network which effectively magnifies any existing irregularities or problems.

SMA presented various recommendations – at the planning level, in terms of reopening the route to minimise the stability risks and at the transport regulation level with regard to traffic management systems.



RFF, Picardy Region and SNCF: Picardy There has been a regular interval timetable in the French region of Picardy since December 2011, which has resulted in a more manageable service. However, the problems caused by the high capacity utilisation of the TER and Intercity trains at peak times on the main axes of Paris–Amiens and Paris–Saint-Quentin remain unresolved. In addition, the planned improvement measures are barely sufficient for an appropriate response to the forecasted increase in demand over the next few years.

In this context SMA was commissioned by RFF, the Picardy region and SNCF to carry out a study to ascertain how the increasing traffic volume might be managed by a flexible, robust service with the aid of a new link concept for these two axes.

SMA produced various timetables, initially up to the year 2015 operating at maximum capacity with fixed constraints, then for subsequent time periods (2020 and beyond). In this way, we were able to determine the most important methods, infrastructure measures or equipment optimisations to substantially increase capacity in the long term. For each timescale, we evaluated and compared the timetable versions using criteria such as service quality and capacity utilisation on the critical route segments.

In the first study phase, with the collaboration of all participants, we developed a new systematic timetable for the Paris–Amiens and Paris–Saint-Quentin axes for the 2015 operating year. This best meets the forecasted demand based on the material and infrastructure resources available. A second analysis demonstrates how well this timetable satisfies the growing demand up to 2020 – against the background of various strategies for the essential modernisation of the rolling stock. The compatibility of the timetable with the Roissy–Picardy LGV link was tested and confirmed. Finally, various different scenarios of long-term service expansion were run, and the functionality and upgrades necessary for this timescale were defined.



Contribution to the alternatives analysis on the Northeast Corridor from

Washington D.C. to Boston The Federal Railroad Administration (FRA) commissioned in 2012 the NEC FUTURE project. This is a planning study to define future investments in the Northeast Corridor (NEC). The NEC connects the Northeast region from Washington to New York and Boston, extending over a distance of more than 700 kilometres. Roughly 2200 trains serve the corridor each day, including a large proportion of regional trains that provide access to the metropolitan centres, and frequent intercity trains that achieve very competitive journey times. For example, more than 70% of all passengers choose rail over air transportation between New York and Washington.

Although the corridor plays an important transportation role in the Northeast region of the United States, investment has not kept pace with the need to renew the century-old infrastructure or to provide adequate capacity for existing and future travel demand.

During the first phase of the NEC FUTURE project, SMA worked with the Parsons Brinckerhoff/AECOM Joint Venture that helped the FRA to address these issues. SMA contributed to the service and operations analysis for the Preliminary Alternatives that range from modest investments in the existing corridor to entirely new dedicated High Speed Lines. The alternatives represent the entire range of possible future configurations for the NEC and therefore the analysis required a planning approach that used the appropriate level of detail for each step to manage the complexity of the task.

New Viriato licenses

New customers

- Appenzellerbahnen AB, Herisau (CH)
- University of Birmingham, Birmingham (UK)
- Amt für öffentlichen Verkehr Kanton Zug, Zug (CH)
- Jernbaneverket JBV, Oslo (NO)
- Ente Autonomo Volturno, Napoli (IT)

Additional licenses

- Rhätische Bahn RhB, Chur (CH)
- Norges Statsbaner AS NSB, Oslo (NO)

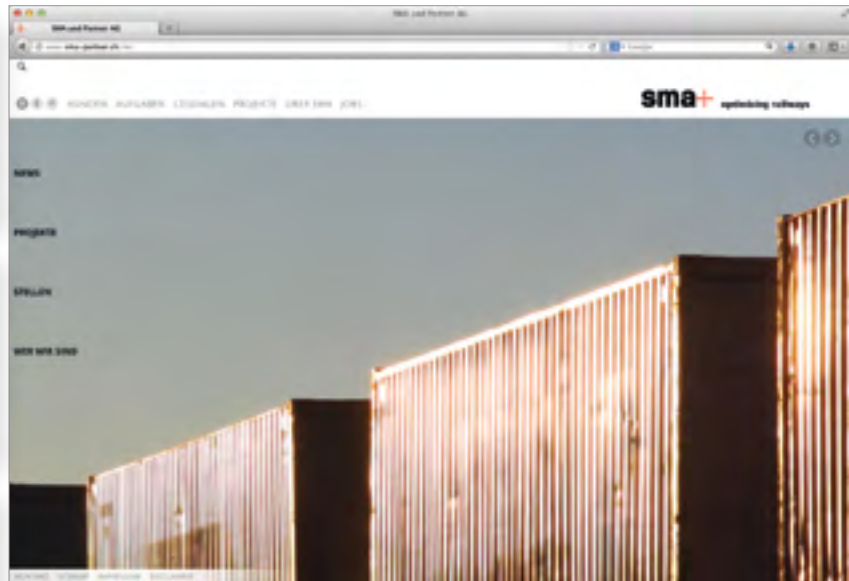


“Visually we wanted to express how we are emotionally connected to the railway, in spite of our highly technical field of work.”



Marketing

A new web presence After producing new company presentations and brochures in 2012, we exploited the momentum this year by developing a new website. The thrust of the plan was clear to us. Visually we wanted to use large images to express how we are emotionally connected to the railway, in spite of our highly technical field of work. For the content, we built on the concept of the company printed brochures, which describe our consulting activity and our software solutions clearly.



A special feature of the website is the interactive graphics. Visitors can select which of our three main client groups they belong to (train operators, infrastructure managers and public authorities) and over which timescale they see optimisation potential (from minutes to decades). They are then shown which activities they are likely to be currently involved with, and most importantly what solutions SMA can provide for them. A key part of the new website is that we show projects in the specific user-selected areas that have been successfully completed during the last four years. These completed projects can be filtered by task, business area, region and client type so that concrete evidence is shown for every topic.

IT13.rail 2013 got off to a good start with the IT13.rail conference at the ETH Zurich. Originally a conference for Viriato users, the events IT05.rail, IT08.rail and IT10.rail have grown over the years into an international benchmark series. IT13.rail took place from 17 to 19 January 2013 under the title “A new railway age – Future Challenges and Opportunities in Quality and Capacity Optimisation”. The conference was again organised jointly by four organisers: IVT (Institute for Transport Planning and Systems at ETH Zurich), OpenTrack Railway Technology GmbH, systransis AG and SMA und Partner AG. Over 200 participants from 18 countries and numerous media representatives travelled to the ETH at Zurich Hönggerberg to participate.

The event started on Thursday with a full-day symposium. A series of renowned experts from research, railways and public authorities outlined the future of the rail system, described the challenges facing us and showed how modern IT solutions can optimise quality and capacity. Professor Ulrich Weidmann from the Institute for Transport Planning and Systems at ETH Zurich chaired the interesting closing podium discussion.

Friday was devoted to the subject “Application and Innovation”. Each of the organisers conducted their own seminars. SMA’s lectures under the title “Precision Hierarchy in Planning and Production” included topics such as “Strategic planning based on the characteristics of major projects in France” (François Tainturier, RFF), “Coordinating short and medium-term planning in a competitive market” (Alain Barbey, TGV Lyria) and “Industrialisation of the timetable – construction based on path allocation” (Dr. Michael Beck, DB Netz AG) – just to give you a flavour of the stimulating programme.

It is traditional that the participants leave the lecture theatres of ETH on Saturday for an excursion and site visit. This year the trip was to Zurich Airport: on the programme was a visit to the new SBB rail operations centre and Swissport’s baggage sorting facility as well as a look at the logistics of the fire service and emergency operations control centre at the airport.

The next event in this series is planned for summer 2015. Preparations are already underway.

"A consulting and IT company like SMA stands and falls by its staff. Without doubt they are our most important resource."

	Destination	
3	CREIL	FLANDRE
6	LILLE	RIEUX
9	CREIL	LENS
52	ARRAS	BETHUNE
55	BRUXELLES	MIDI
01	PERSAN	CHAMBLY
13	EBBSFLEET	LONDON
16	LILLE	FLANDRES
26	CREPY	VILLERS
3	PERSAN	CHAMBLY
4	LONGUEAU	AMIENS
4	CREIL	PONT
14	ORRY-LA-VILLE	COMP
14	BRUXELLES	M.
14	BRUXELLES	MID
14	COMPIEGNE	ST-
14	LILLE	FLANDR
14	DAMMARTIN	CF
16	RIEUX	QUA

Staff

Employees, company and ethics A consulting and IT company like SMA stands and falls by its staff. Without doubt they are our most important resource. Naturally, we also benefit from the fact that SMA has been an industry leader in its field since its foundation and is known and respected in the railway industry. But, ultimately, this reputation is solely due to our staff.

The company culture of SMA has contributed towards a strong feeling of loyalty among the staff. This has not only encouraged an internal team spirit but also strengthened the SMA brand externally. Factors such as mutual respect, loyalty and short lines of communication are simultaneously a requirement and the result of this culture. However, SMA's identity is also based on values such as high expectations of quality, credibility within the railway industry and freedom to innovate on any topic. We have to nurture these values because they have not only been an important part of SMA's success until now but will remain so in the future.

The succession process within the company management offered an opportunity to reflect on company and management philosophy. Inevitably, a company assumes standards of ethics and morals based on strategic, organisational and cultural factors. The employees themselves have in their private and professional lives their own ethics. In an unfavourable situation, these ways of thinking may collide resulting in conflict between economic efficiency and personal idealism.

An ethical programme by the company and management may apply suitable conditions to reduce this potential for conflict. However, a mission statement, structures, rules and objectives alone are by no means enough: it is much more important that management preserve and exemplify a culture of trust, such as that which has always prevailed at SMA. In this sense, managing is a question of awareness, of relationships between people and especially of communication.

Staff

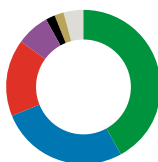
Employees (end 2013)	68
Equivalent full-time employees	61
Average years of work experience	9.6 years
Average years at SMA	5.7 years
Average age	34.5 years
Students	7 in Zurich 2 in Lausanne

Financial report

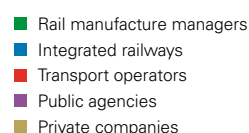
SMA can be proud of achieving the financial targets set at the beginning of the year. Our investment in 2012, particularly in Viriato Enterprise, came to fruition in 2013. More generally, SMA managed to consolidate its core European markets, while diversifying into new regions. The diversity of our clients in the rail sector also reflects the healthy, long-term sustainable development of our business.

Key figures in millions of Swiss francs	2013	2012
Gross turnover	12.50	10.45
Turnover/colleague (61 full-time positions)	0.20	0.19

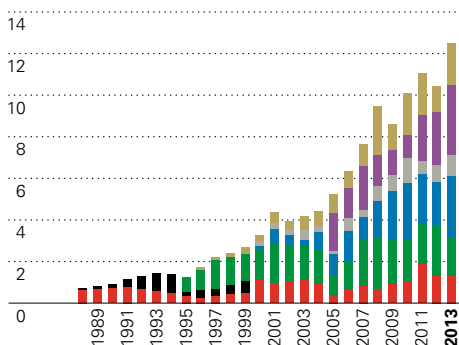
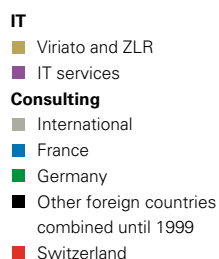
Turnover by country



Turnover by client category



Development of turnover 1988 – 2013 (millions CHF)



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Reiner Hausleitner

Umschlag

Reiner Hausleitner

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Deutsche Bahn AG | Christian Bedeschinski

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Panthermedia

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Deutsche Bahn AG | Günter Jazbec

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**Head Office**

SMA und Partner AG
Gubelstrasse 28
CH-8050 Zurich
Phone +41 44 317 50 60

Branch Office

SMA et associés SA
Avenue de la Gare 1
CH-1003 Lausanne
Phone +41 21 620 08 08

info@sma-partner.ch
www.sma-partner.ch